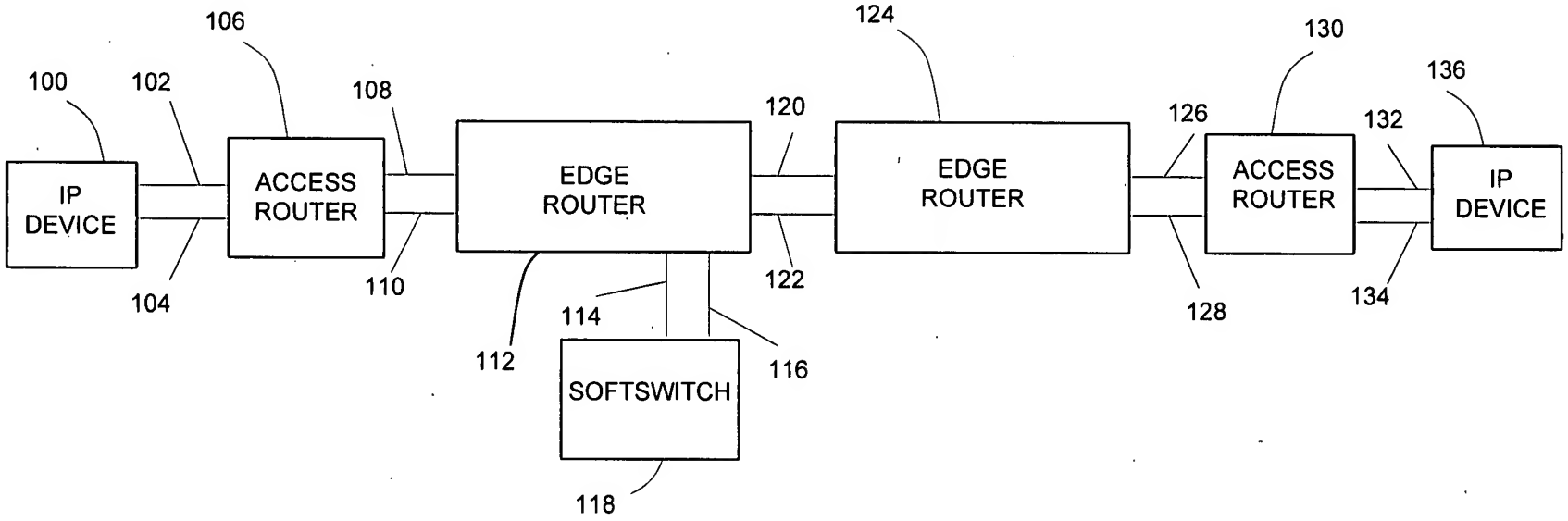


PRIOR ART

FIGURE 1

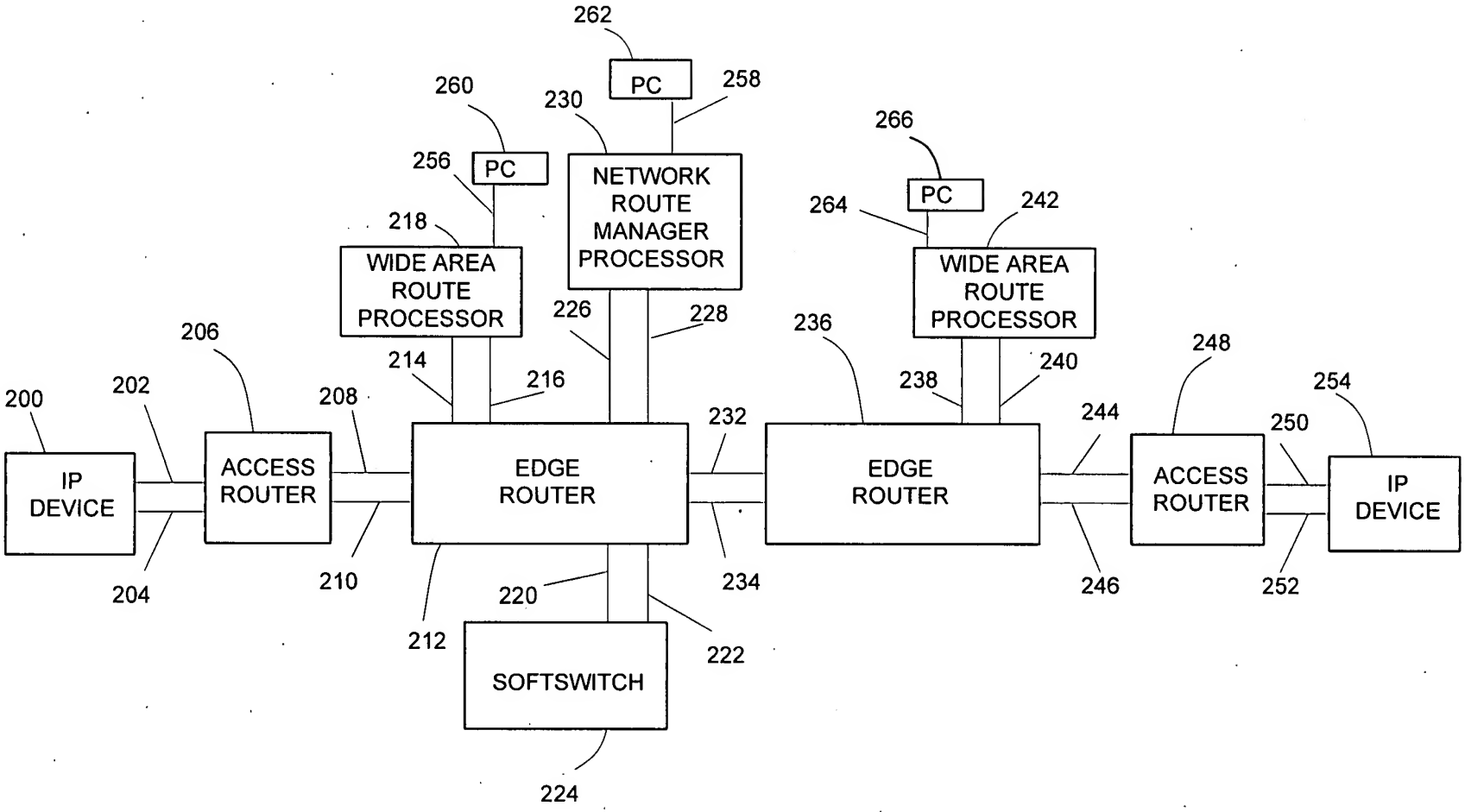

262
PC
258
260
230
266
256
PC
NETWORK ROUTE MANAGER PROCESSOR
PC
264
242
218
WIDE AREA ROUTE PROCESSOR
WIDE AREA ROUTE PROCESSOR
226
228
236
206
248
214
216
238
240
254
200
202
208
232
244
250
IP DEVICE
ACCESS ROUTER
EDGE ROUTER
EDGE ROUTER
ACCESS ROUTER
IP DEVICE
204
210
212
220
234
246
252
222
SOFTSWITCH
224

FIGURE 2

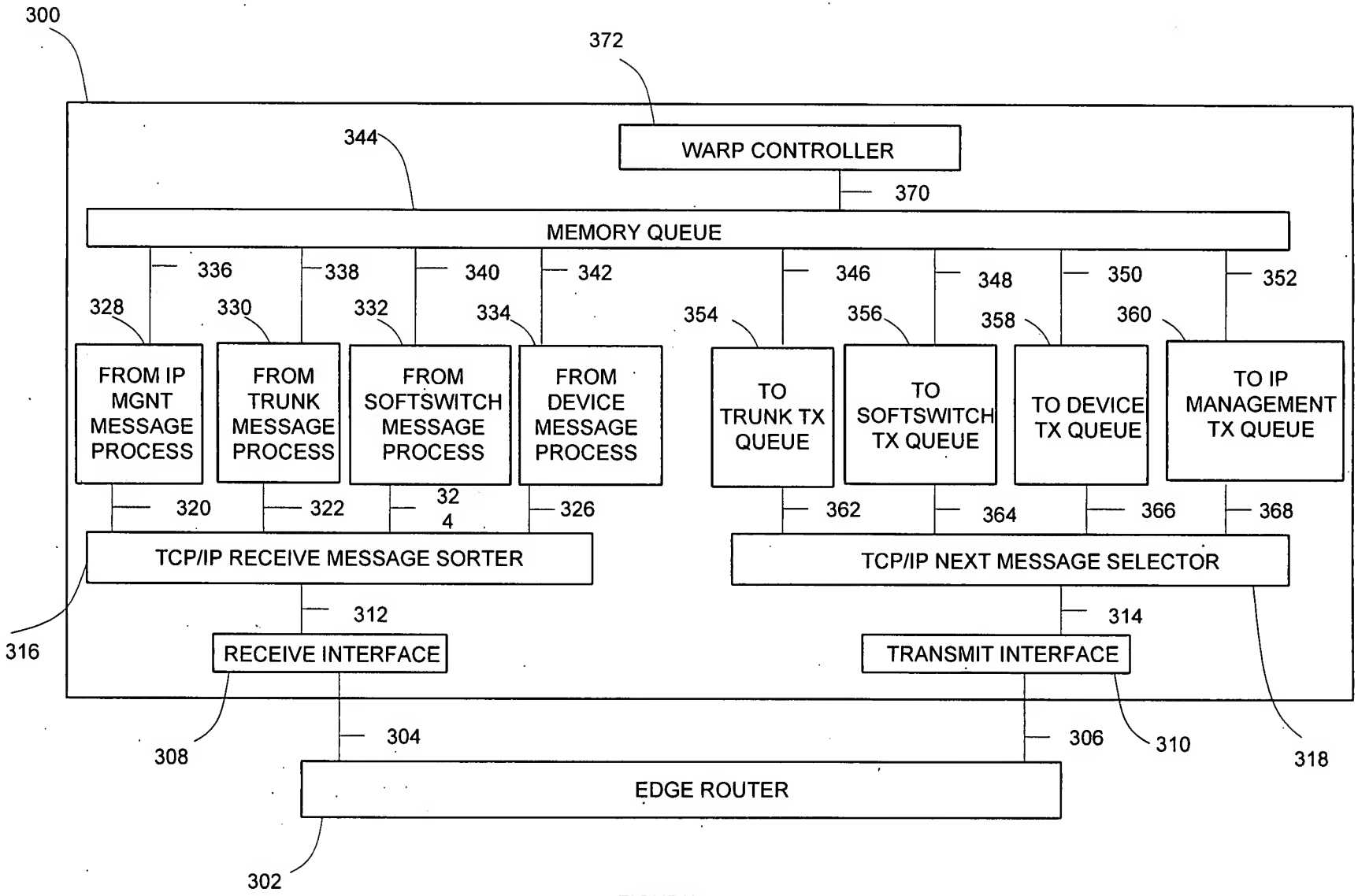

300
372
344
WARP CONTROLLER
370
MEMORY QUEUE
336
338
340
342
346
348
350
352
328
330
332
334
354
356
358
360
FROM IP MGNT MESSAGE PROCESS
FROM TRUNK MESSAGE PROCESS
FROM SOFTSWITCH MESSAGE PROCESS
FROM DEVICE MESSAGE PROCESS
TO TRUNK TX QUEUE
TO SOFTSWITCH TX QUEUE
TO DEVICE TX QUEUE
TO IP MANAGEMENT TX QUEUE
320
322
324
326
362
364
366
368
TCP/IP RECEIVE MESSAGE SORTER
TCP/IP NEXT MESSAGE SELECTOR
316
312
314
RECEIVE INTERFACE
TRANSMIT INTERFACE
308
304
306
310
318
EDGE ROUTER
302

FIGURE 3

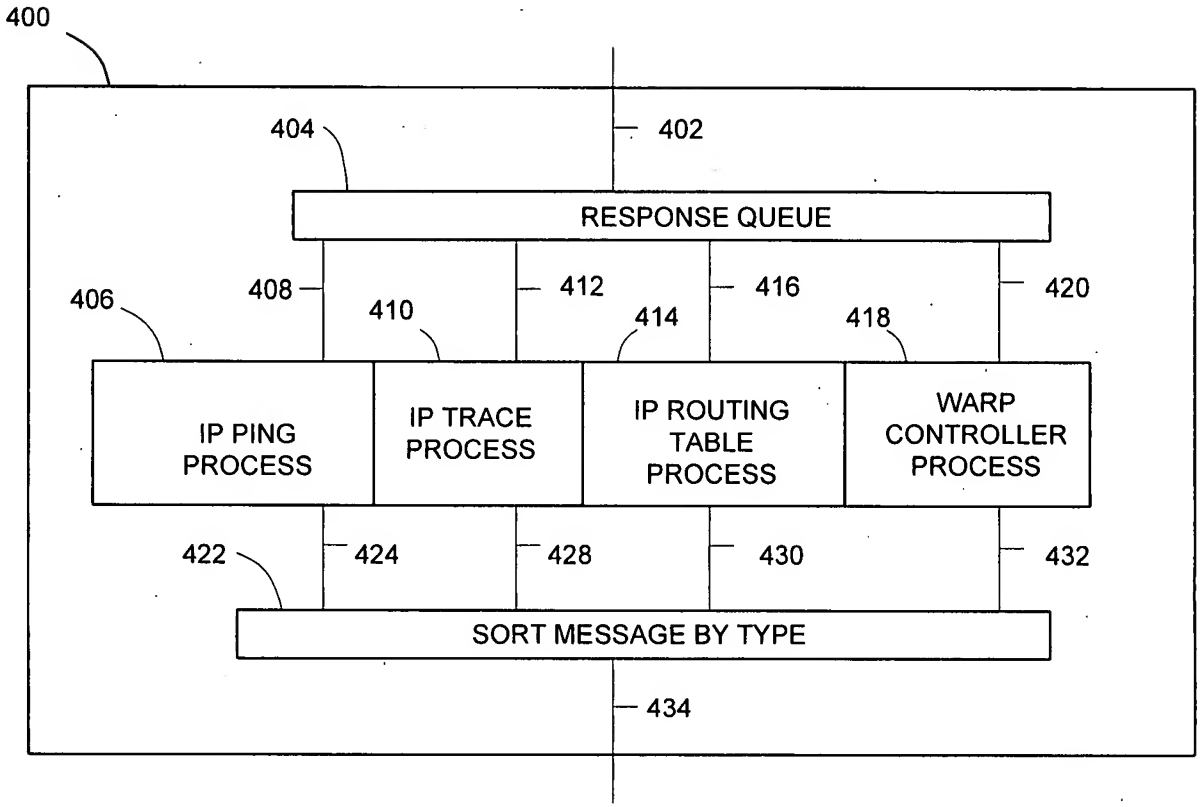

400
402
404
RESPONSE QUEUE
406
408
410
412
414
416
418
420
IP PING PROCESS
IP TRACE PROCESS
IP ROUTING TABLE PROCESS
WARP CONTROLLER PROCESS
422
424
428
430
432
SORT MESSAGE BY TYPE
434

FIGURE 4

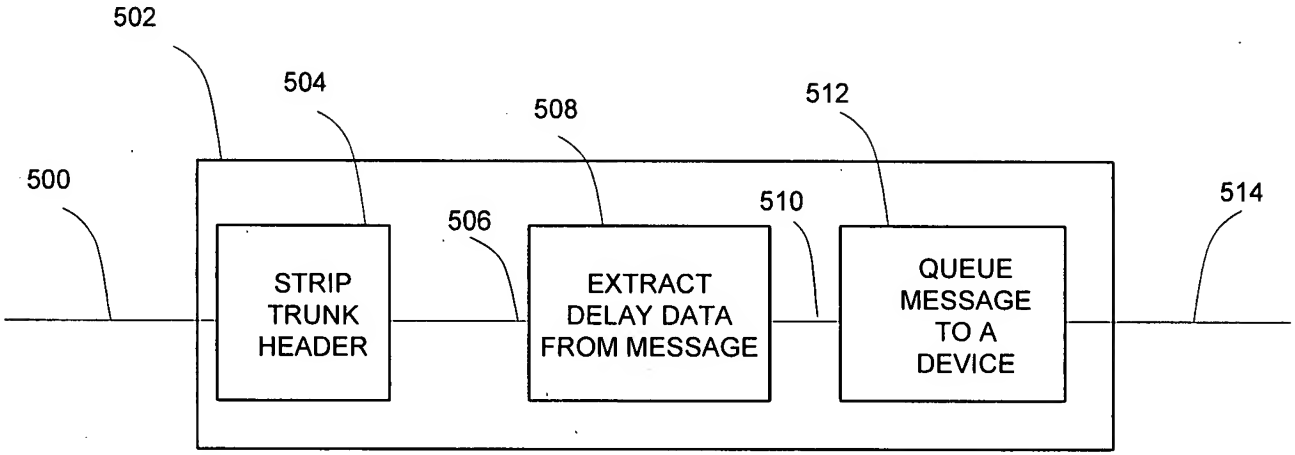

502
504
508
512
500
506
510
514
STRIP TRUNK HEADER
EXTRACT DELAY DATA FROM MESSAGE
QUEUE MESSAGE TO A DEVICE

FIGURE 5

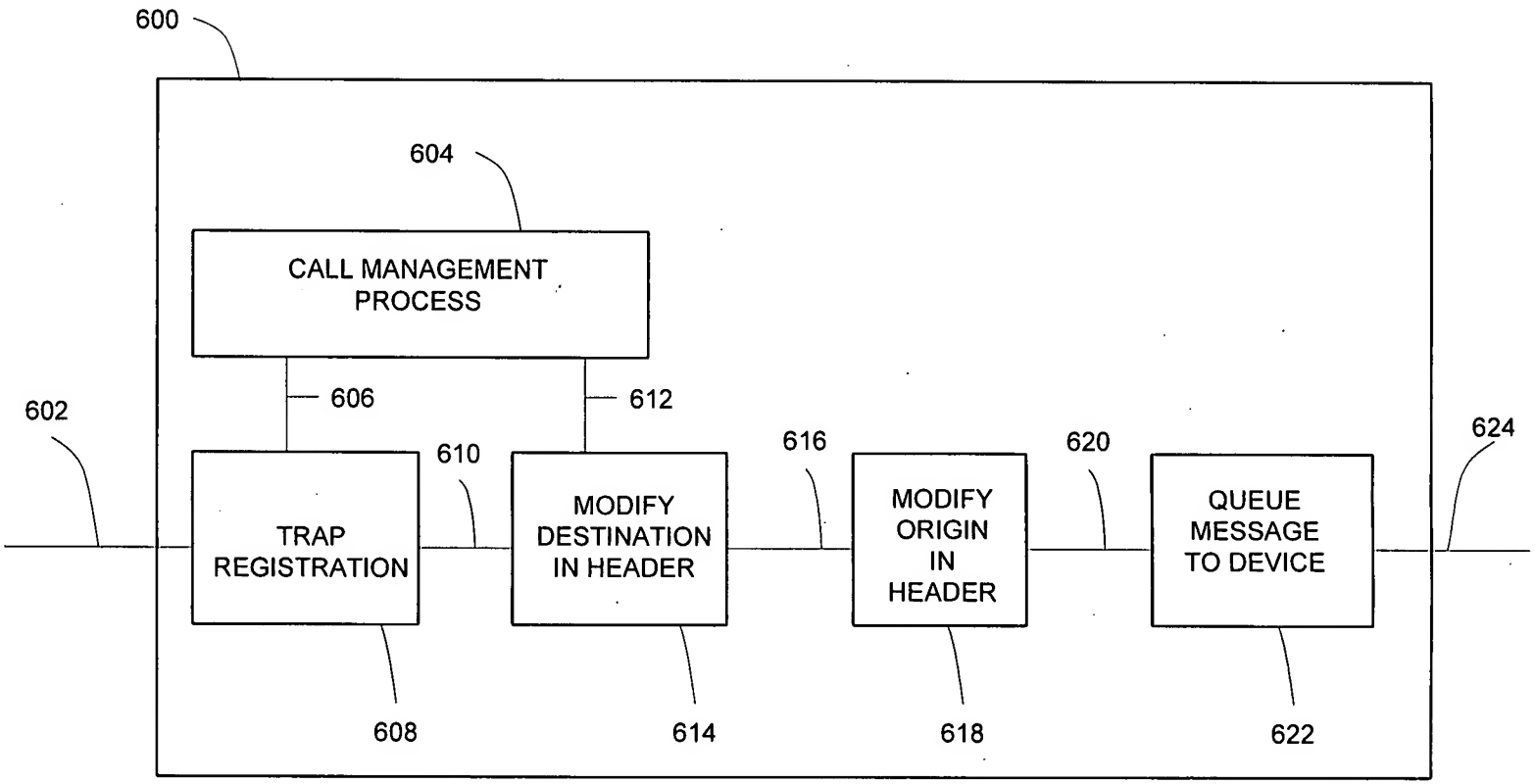

600
604
CALL MANAGEMENT PROCESS
606
612
602
610
616
620
624
TRAP REGISTRATION
MODIFY DESTINATION IN HEADER
MODIFY ORIGIN IN HEADER
QUEUE MESSAGE TO DEVICE
608
614
618
622

FIGURE 6

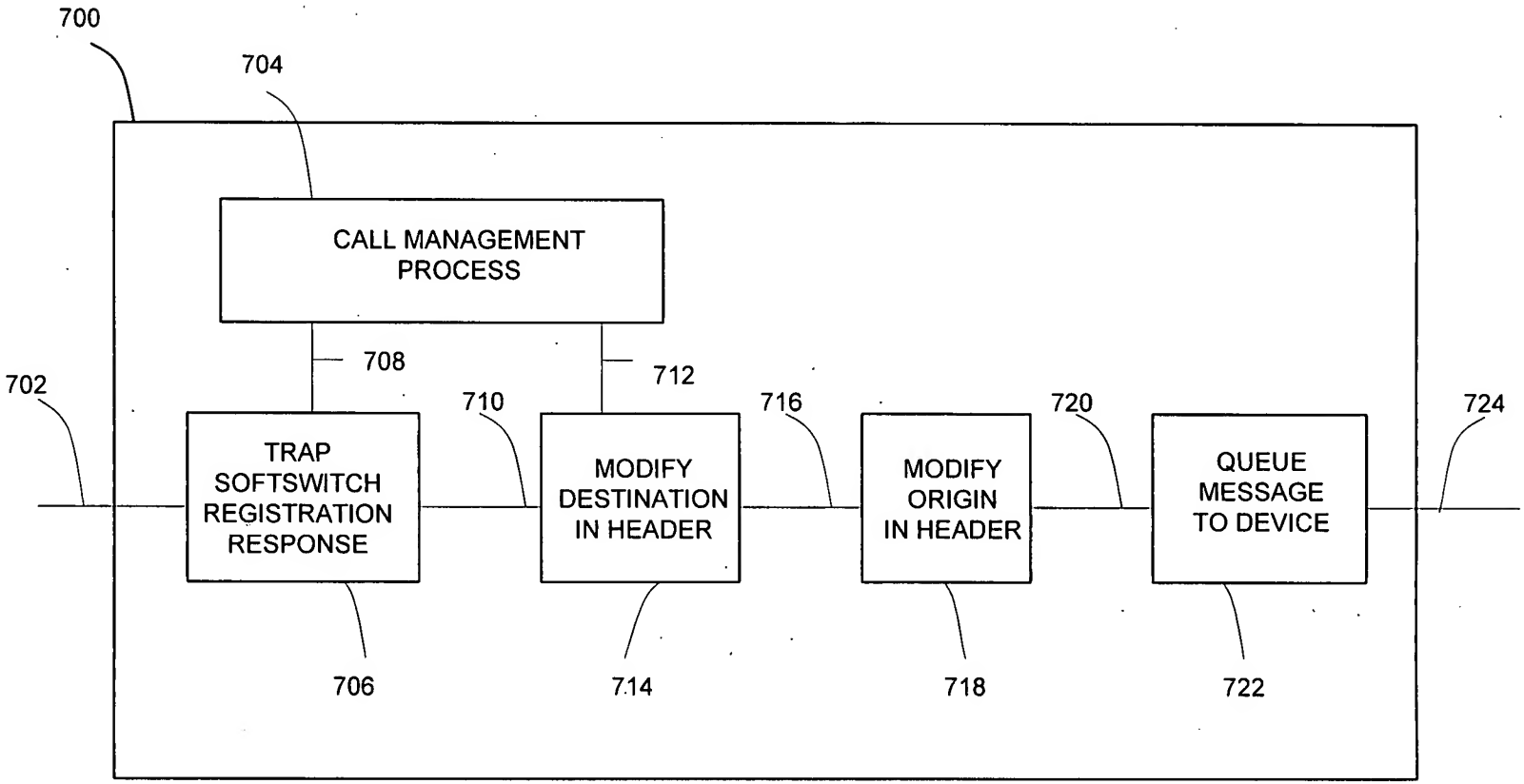

700
704
CALL MANAGEMENT PROCESS
708
712
702
710
716
720
724
TRAP SOFTSWITCH REGISTRATION RESPONSE
MODIFY DESTINATION IN HEADER
MODIFY ORIGIN IN HEADER
QUEUE MESSAGE TO DEVICE
706
714
718
722

FIGURE 7

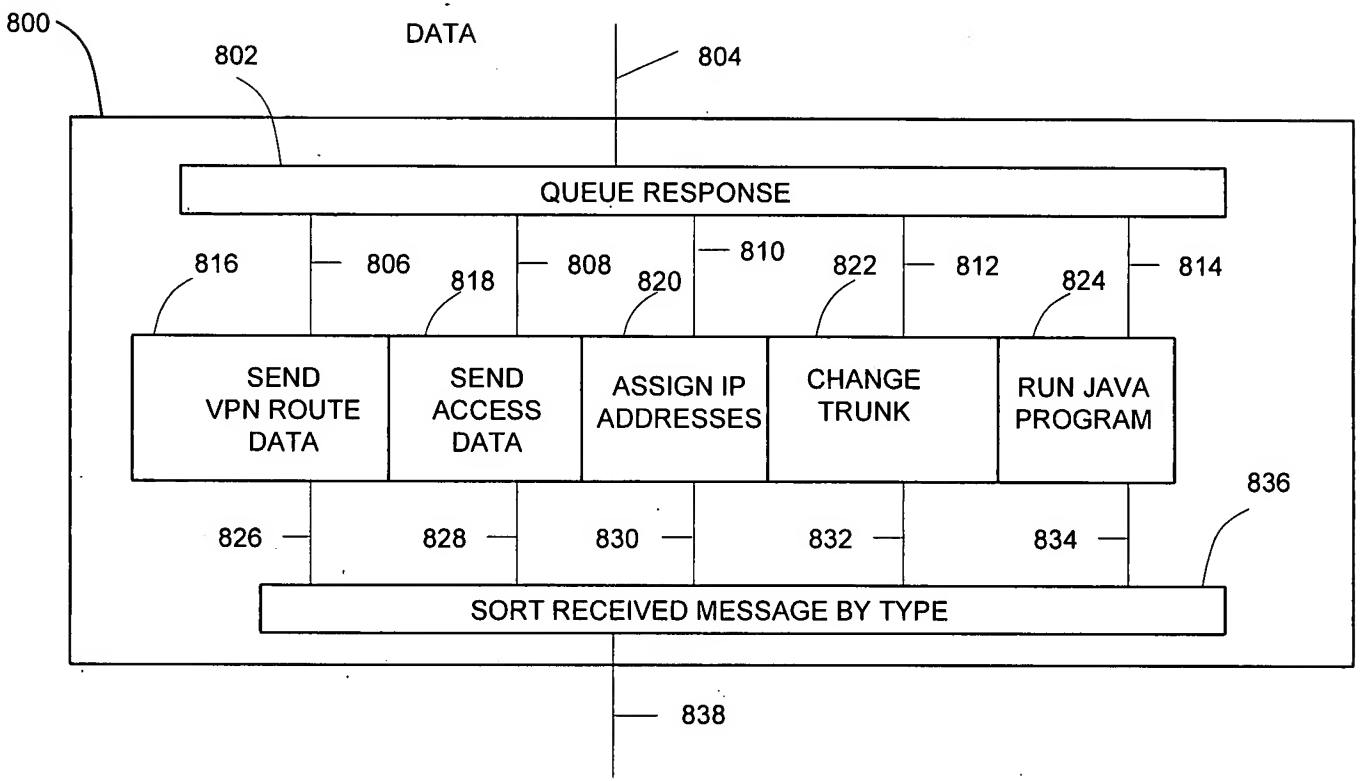

800
802
DATA
804
QUEUE RESPONSE
816
806
818
808
820
810
822
812
824
814
SEND VPN ROUTE DATA
SEND ACCESS DATA
ASSIGN IP ADDRESSES
CHANGE TRUNK
RUN JAVA PROGRAM
836
826
828
830
832
834
SORT RECEIVED MESSAGE BY TYPE
838

FIGURE 8

TRUNK TABLE

ROUTE NUMBER	STATUS	VPN ROUTE SOURCE IP ADDRESS	VPN ROUTE DESTINATION IP ADDRESS	BANDWIDTH
ROUTE NUMBER	STATUS	VPN ROUTE SOURCE IP ADDRESS	VPN ROUTE DESTINATION IP ADDRESS	BANDWIDTH
ROUTE NUMBER	STATUS	VPN ROUTE SOURCE IP ADDRESS	VPN ROUTE DESTINATION IP ADDRESS	BANDWIDTH

FIGURE 9

TRUNK STATUS TABLE

VPN ROUTE NUMBER	VPN ROUTE DELAY STATUS	VPN ROUTE TRACE DATA
VPN ROUTE NUMBER	VPN ROUTE DELAY STATUS	VPN ROUTE TRACE DATA
VPN ROUTE NUMBER	VPN ROUTE DELAY STATUS	VPN ROUTE TRACE DATA

FIGURE 10

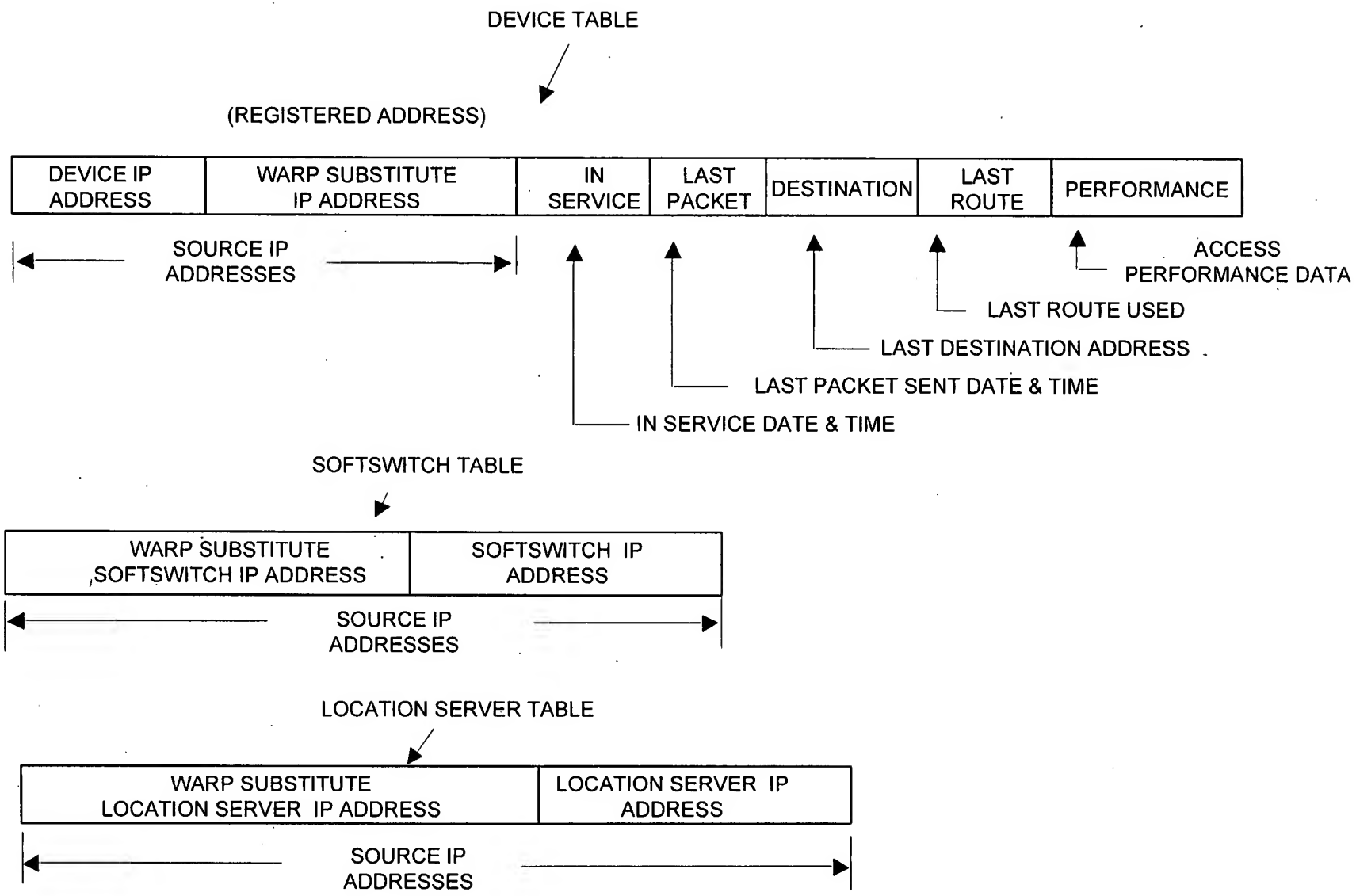
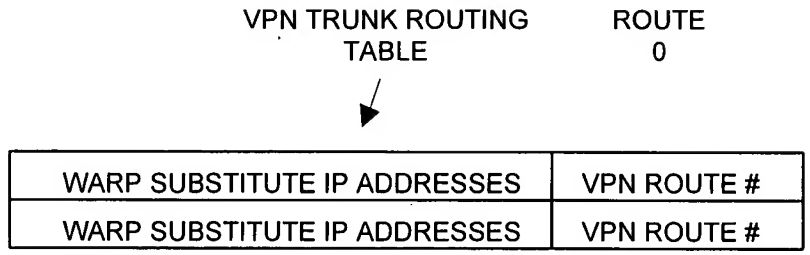

DEVICE TABLE
(REGISTERED ADDRESS)
DEVICE IP ADDRESS
WARP SUBSTITUTE IP ADDRESS
IN SERVICE
LAST PACKET
DESTINATION
LAST ROUTE
PERFORMANCE
SOURCE IP ADDRESSES
ACCESS PERFORMANCE DATA
LAST ROUTE USED
LAST DESTINATION ADDRESS
LAST PACKET SENT DATE & TIME
IN SERVICE DATE & TIME
SOFTSWITCH TABLE
WARP SUBSTITUTE SOFTSWITCH IP ADDRESS
SOFTSWITCH IP ADDRESS
SOURCE IP ADDRESSES
LOCATION SERVER TABLE
WARP SUBSTITUTE LOCATION SERVER IP ADDRESS
LOCATION SERVER IP ADDRESS
SOURCE IP ADDRESSES

FIGURE 11


VPN TRUNK ROUTING TABLE
ROUTE 0
WARP SUBSTITUTE IP ADDRESSES
VPN ROUTE #
WARP SUBSTITUTE IP ADDRESSES
VPN ROUTE #
ROUTING TABLE FOR LOCAL SESSIONS

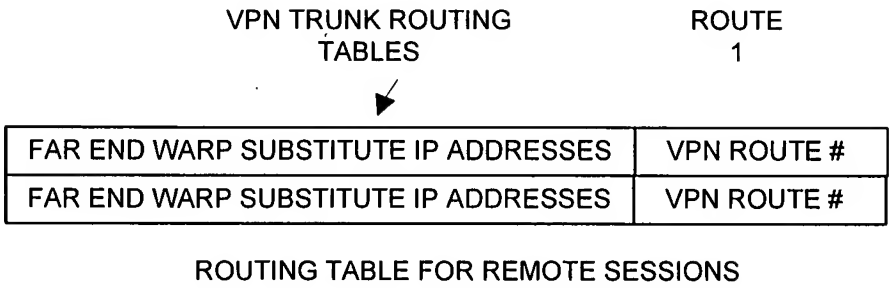

VPN TRUNK ROUTING TABLES
ROUTE 1
FAR END WARP SUBSTITUTE IP ADDRESSES
VPN ROUTE #
FAR END WARP SUBSTITUTE IP ADDRESSES
VPN ROUTE #
ROUTING TABLE FOR REMOTE SESSIONS

FIGURE 12

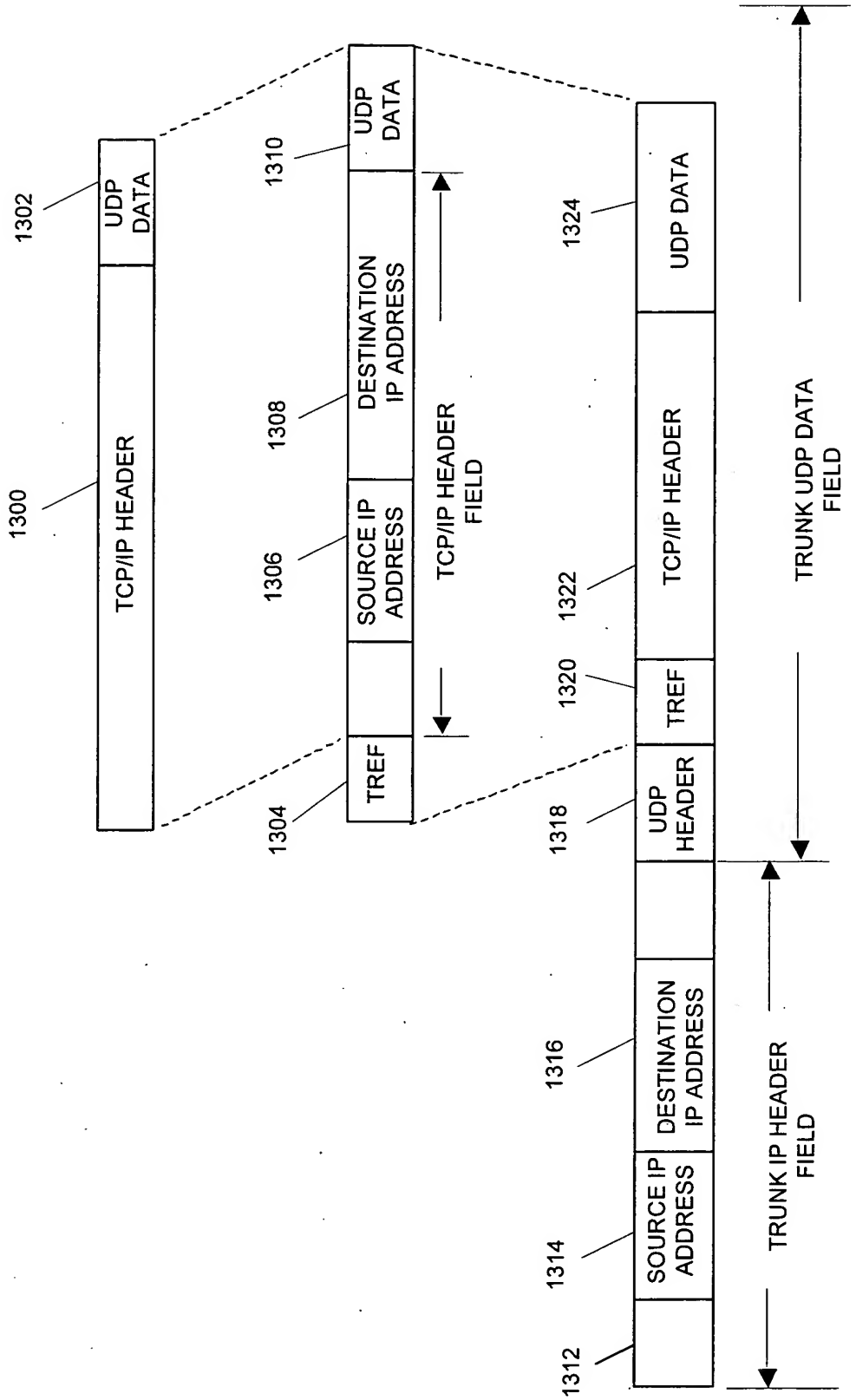

1302
UDP DATA
1300
TCP/IP HEADER
1310
UDP DATA
1308
DESTINATION IP ADDRESS
1306
SOURCE IP ADDRESS
TCP/IP HEADER FIELD
1304
TREF
1324
UDP DATA
1322
TCP/IP HEADER
1320
TREF
1318
UDP HEADER
1316
DESTINATION IP ADDRESS
1314
SOURCE IP ADDRESS
1312
TRUNK UDP DATA FIELD
TRUNK IP HEADER FIELD

FIGURE 13

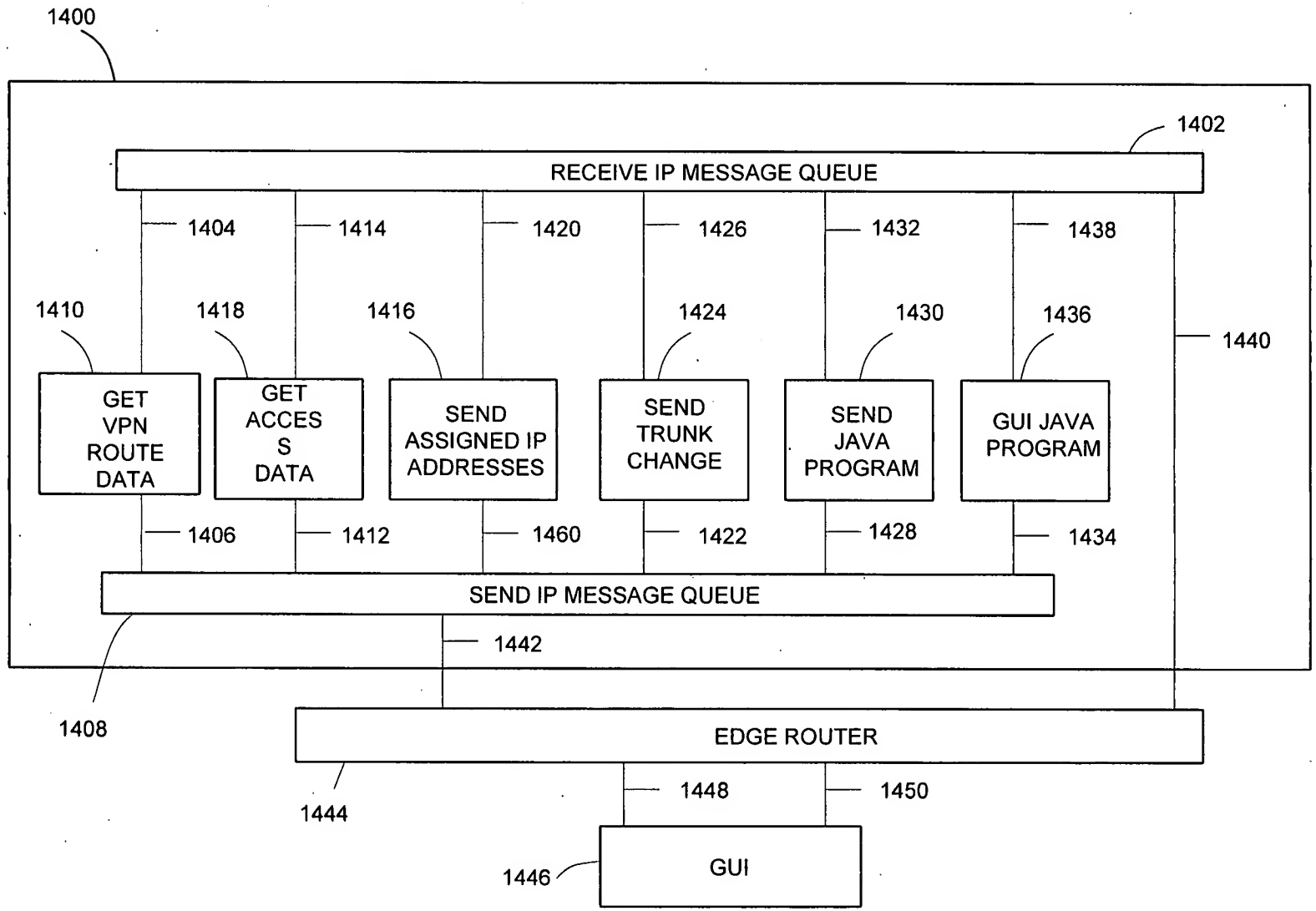
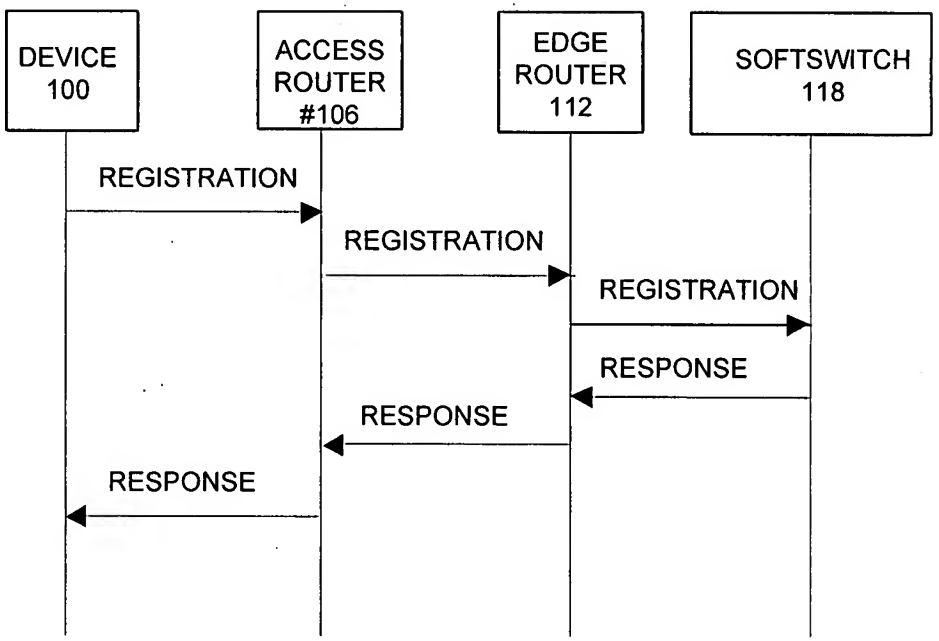
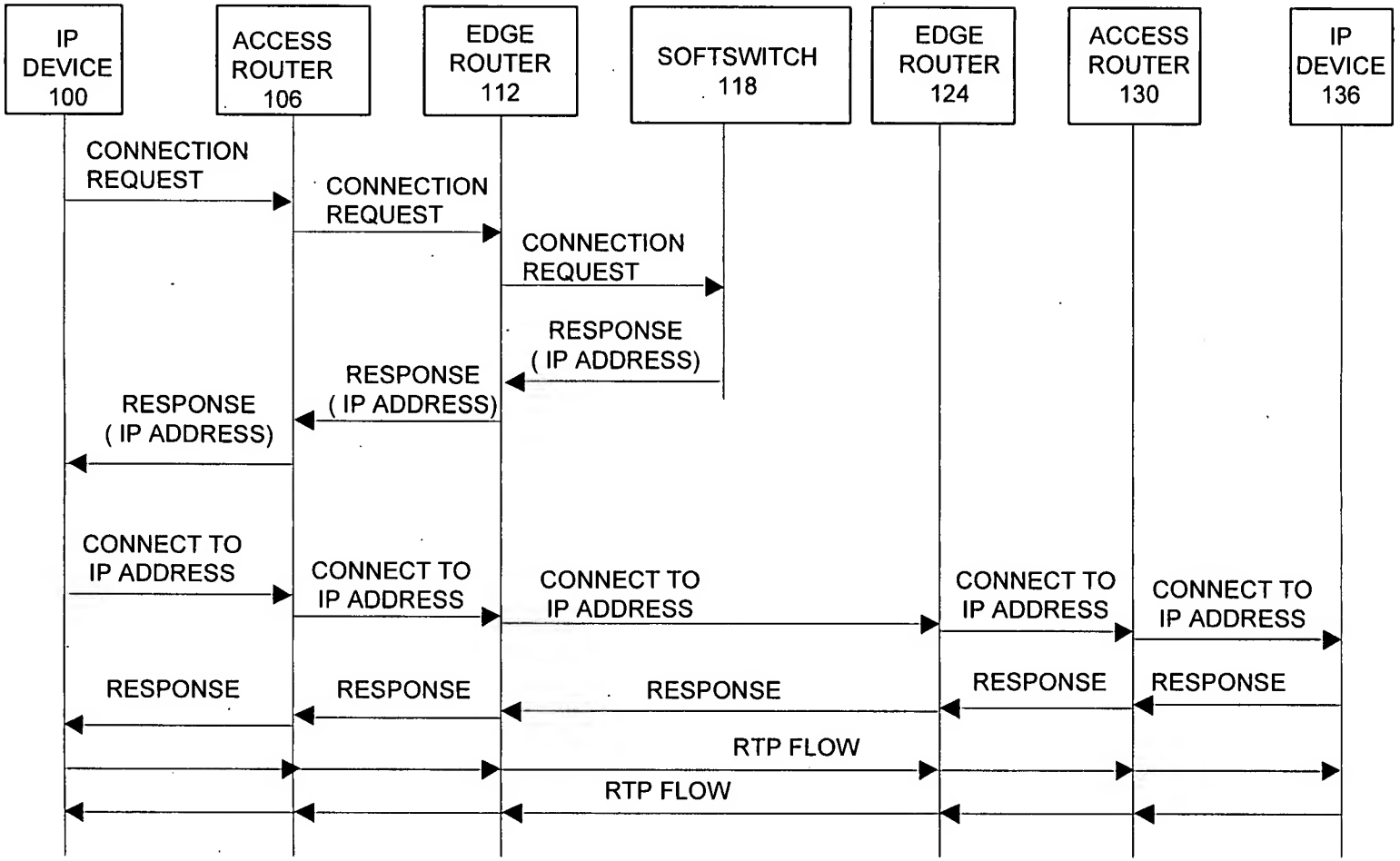

1400
1402
RECEIVE IP MESSAGE QUEUE
1404
1414
1420
1426
1432
1438
1410
1418
1416
1424
1430
1436
1440
GET VPN ROUTE DATA
GET ACCES S DATA
SEND ASSIGNED IP ADDRESSES
SEND TRUNK CHANGE
SEND JAVA PROGRAM
GUI JAVA PROGRAM
1406
1412
1460
1422
1428
1434
SEND IP MESSAGE QUEUE
1442
1408
EDGE ROUTER
1444
1448
1450
1446
GUI

FIGURE 14



PRIOR ART FIGURE 15



PRIOR ART FIGURE 16

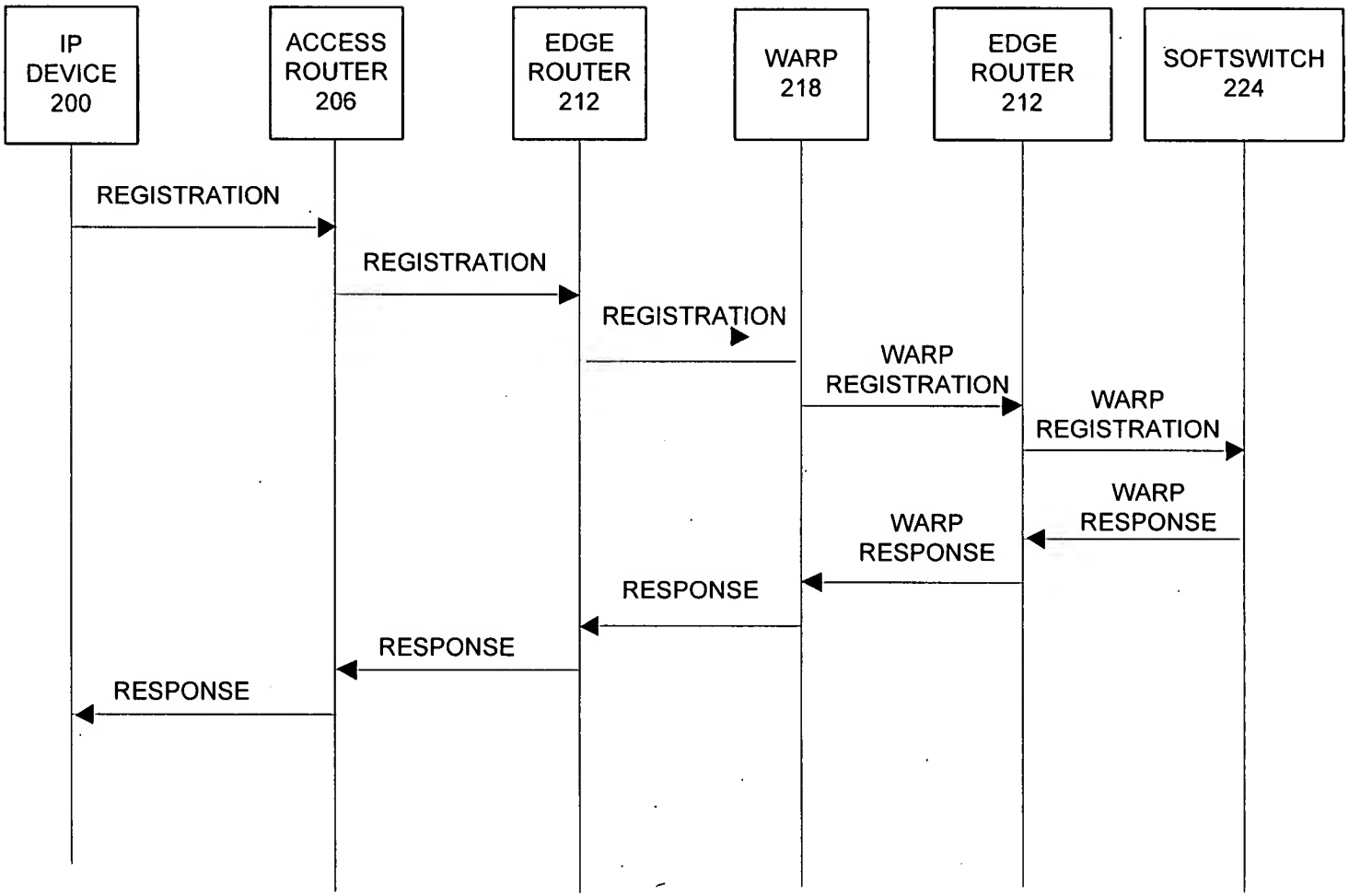

IP DEVICE 200
ACCESS ROUTER 206
EDGE ROUTER 212
WARP 218
EDGE ROUTER 212
SOFTSWITCH 224
REGISTRATION
REGISTRATION
REGISTRATION
WARP REGISTRATION
WARP REGISTRATION
WARP RESPONSE
WARP RESPONSE
RESPONSE
RESPONSE
RESPONSE

FIGURE 17

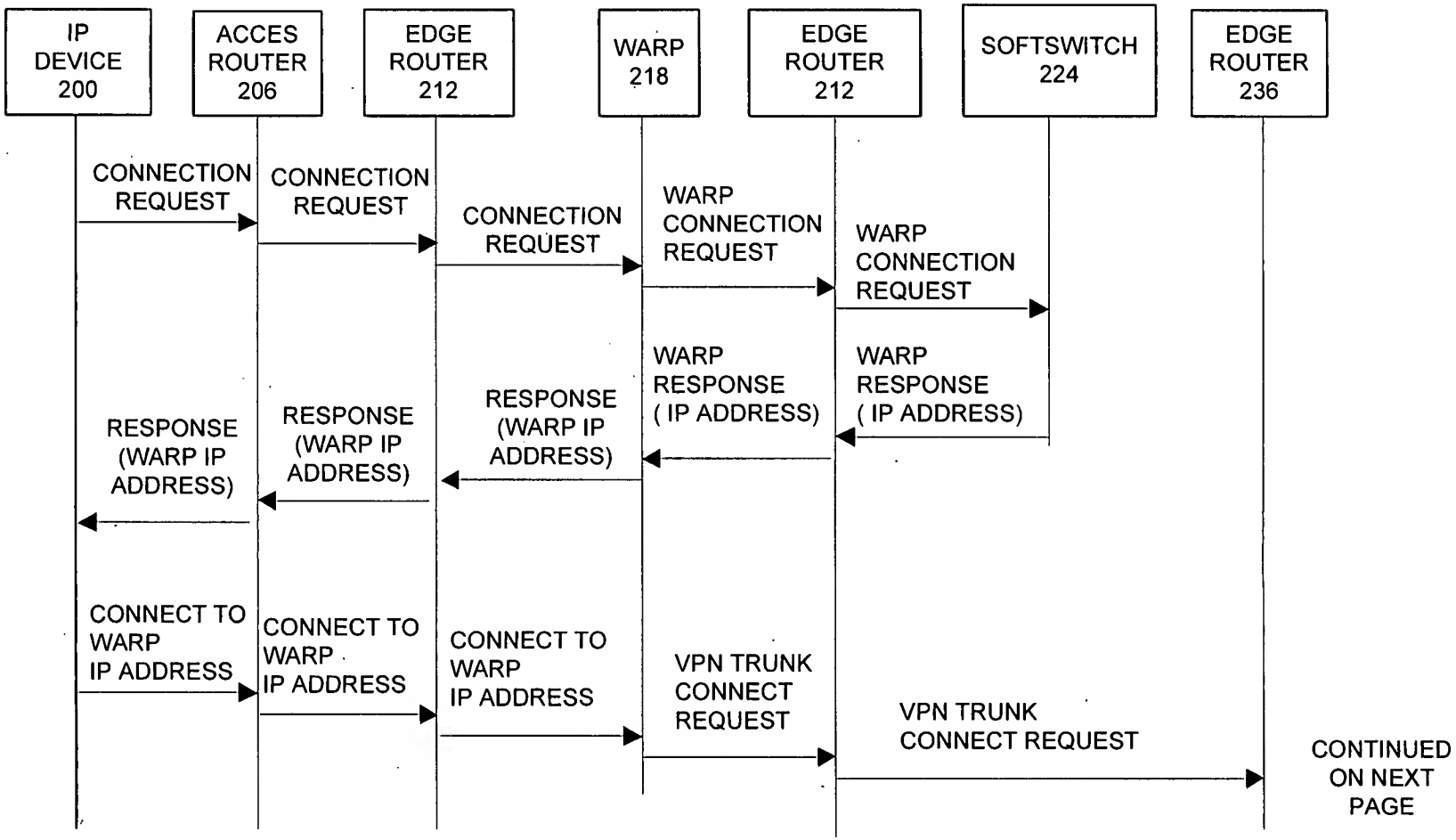

IP DEVICE 200
ACCES ROUTER 206
EDGE ROUTER 212
WARP 218
EDGE ROUTER 212
SOFTSWITCH 224
EDGE ROUTER 236
CONNECTION REQUEST
CONNECTION REQUEST
CONNECTION REQUEST
WARP CONNECTION REQUEST
WARP CONNECTION REQUEST
WARP RESPONSE (IP ADDRESS)
WARP RESPONSE (IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
CONNECT TO WARP IP ADDRESS
CONNECT TO WARP IP ADDRESS
CONNECT TO WARP IP ADDRESS
VPN TRUNK CONNECT REQUEST
VPN TRUNK CONNECT REQUEST
CONTINUED ON NEXT PAGE

FIGURE 18

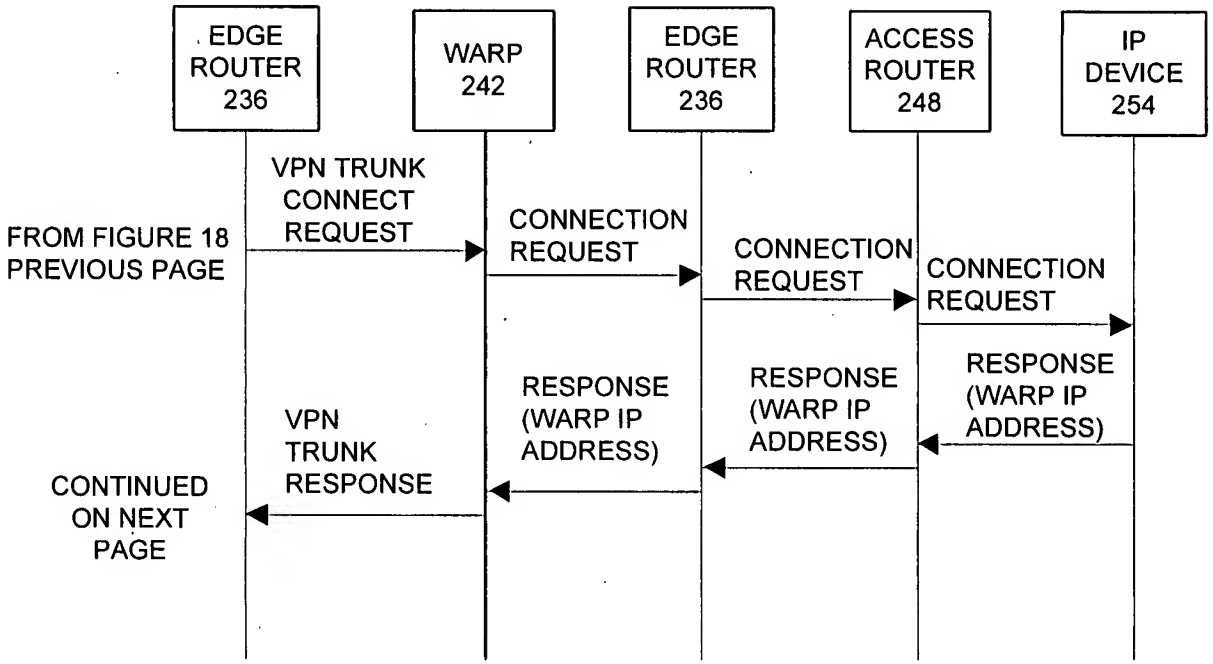

EDGE ROUTER 236
WARP 242
EDGE ROUTER 236
ACCESS ROUTER 248
IP DEVICE 254
FROM FIGURE 18 PREVIOUS PAGE
VPN TRUNK CONNECT REQUEST
CONNECTION REQUEST
CONNECTION REQUEST
CONNECTION REQUEST
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
VPN TRUNK RESPONSE
CONTINUED ON NEXT PAGE

FIGURE 19

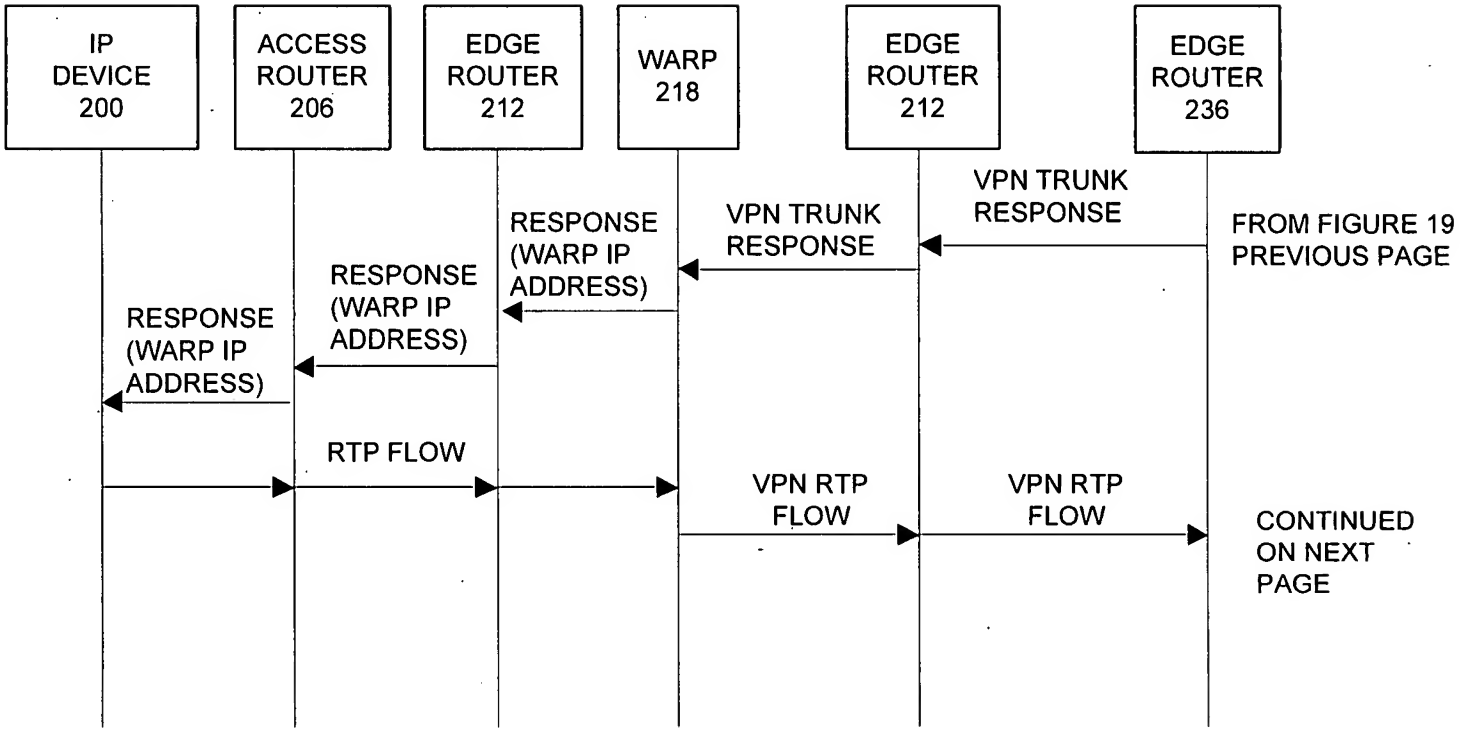

IP DEVICE 200
ACCESS ROUTER 206
EDGE ROUTER 212
WARP 218
EDGE ROUTER 212
EDGE ROUTER 236
VPN TRUNK RESPONSE
FROM FIGURE 19 PREVIOUS PAGE
VPN TRUNK RESPONSE
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
RESPONSE (WARP IP ADDRESS)
RTP FLOW
VPN RTP FLOW
VPN RTP FLOW
CONTINUED ON NEXT PAGE

FIGURE 20

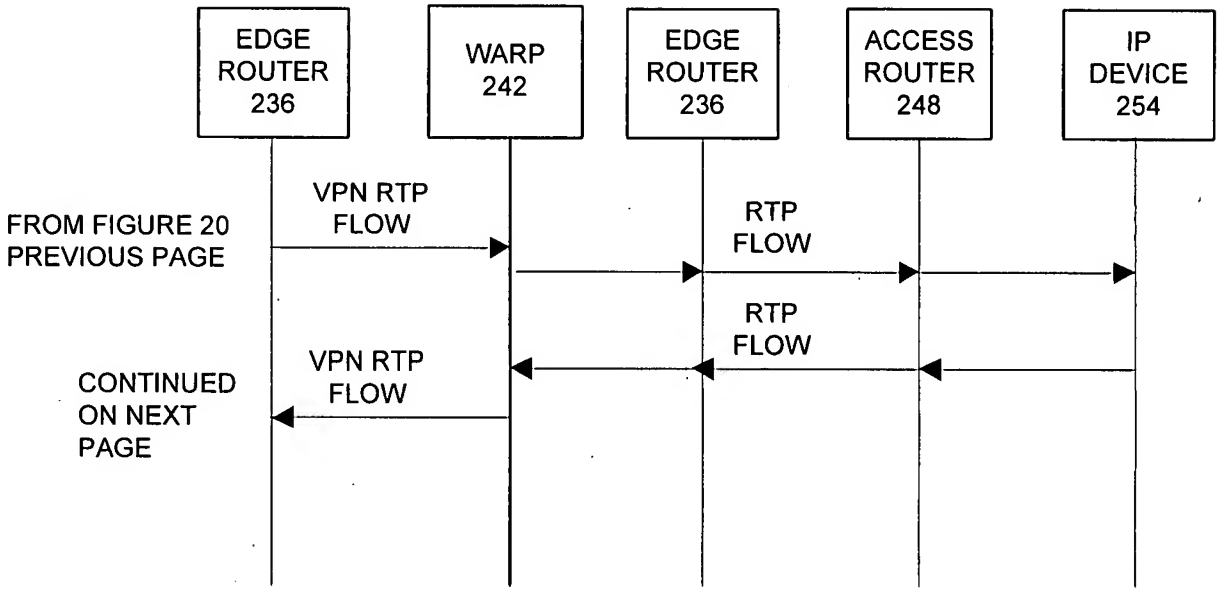

EDGE ROUTER 236
WARP 242
EDGE ROUTER 236
ACCESS ROUTER 248
IP DEVICE 254
FROM FIGURE 20 PREVIOUS PAGE
VPN RTP FLOW
RTP FLOW
RTP FLOW
VPN RTP FLOW
CONTINUED ON NEXT PAGE

FIGURE 21

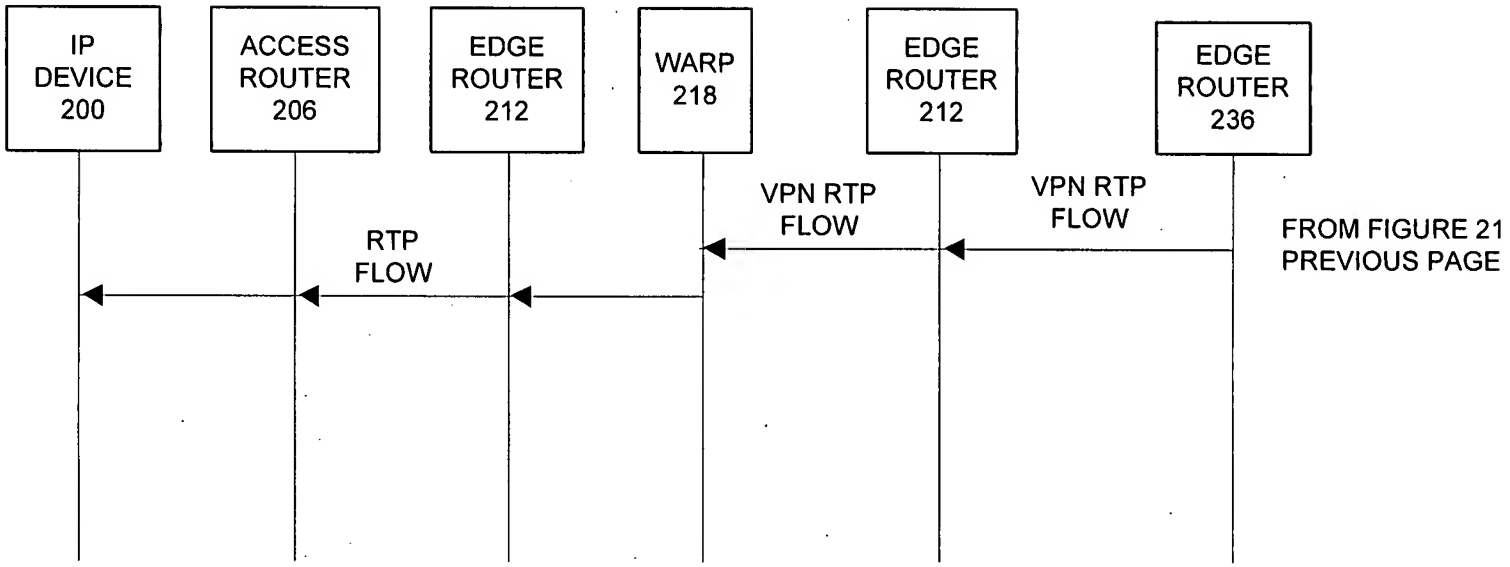

IP DEVICE 200
ACCESS ROUTER 206
EDGE ROUTER 212
WARP 218
EDGE ROUTER 212
EDGE ROUTER 236
VPN RTP FLOW
VPN RTP FLOW
RTP FLOW
FROM FIGURE 21 PREVIOUS PAGE

FIGURE 22

VARIABLES TABLE 6

TRUNK TRACE INTERVAL TIME
TRUNK PING INTERVAL TIME
DEVICE TRACE INTERVAL TIME
DEVICE PING INTERVAL TIME

FIGURE 23

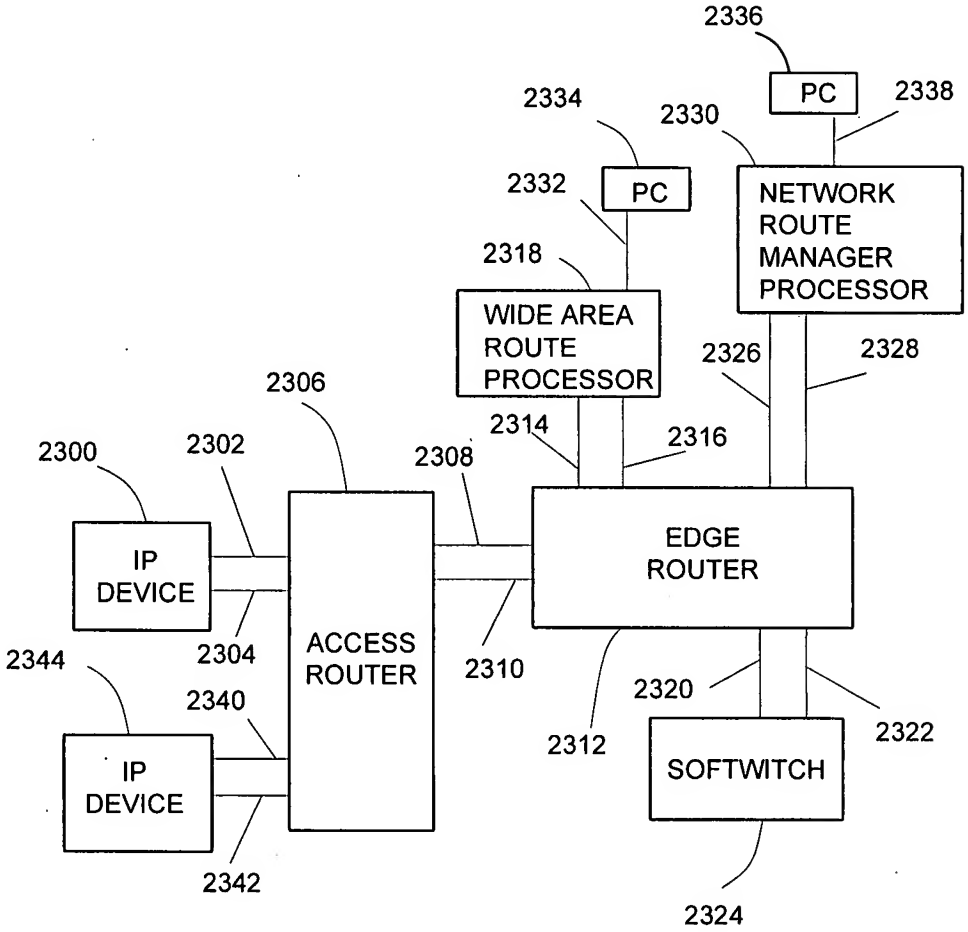

2336
PC
2338
2334
2330
2332
PC
NETWORK ROUTE MANAGER PROCESSOR
2318
WIDE AREA ROUTE PROCESSOR
2326
2328
2306
2314
2316
2300
2302
2308
IP DEVICE
ACCESS ROUTER
EDGE ROUTER
2304
2310
2344
2340
2320
2322
2312
IP DEVICE
SOFTWITCH
2342
2324

FIGURE 24